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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/899,383	07/03/2001	Scott A. Chalmers	02578.0006.CPUS01	3031

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EXAMINER

PHAM, HOA Q

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/899,383

Applicant(s)

CHALMERS ET AL.

Examiner

Hoa Q. Pham

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 2877

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-55 and 58-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ledger (5,291,269) in view of Cabib et al (5,856,871) and Finland reference (*ImSpector* imaging Spectrograph brochure including specifications, **Spectral Imaging Ltd.**) (of record).

Regarding claims 1, 7, 16-19, 21, 24, 27, and 35- 41; Ledger discloses a method and apparatus for measuring the thickness of a thin film layer in which the thickness is determined on the basis of interference fringe pattern images. Ledger does not teach that an imaging spectrometer for deriving a plurality of one-spatial-dimension spectral images. However, such a feature is known in the art as taught by Cabib et al and Finland reference. Cabib et al teaches that an imaging spectrometer or spectral imager using for resource mapping of the earth surface from airplanes and satellites could be used for film thickness mapping (column 2 lines 8-23). Furthermore, Finland reference teaches that imaging spectrometer is a one-spatial-dimension imaging spectrometer (figure in page 1). Those of ordinary skill in the art at the time the invention was made to replace the imaging detecting unit of Ledger by a one-spatial-dimension imaging

Art Unit: 2877

spectrometer as taught by Finland reference because Cabib et al suggests that such the imaging spectrometer could be used in the field of semiconductor processing.

Regarding claims 2-3, 23, 25, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a spectrometer having resolution of 1nm or better. Thus, an accuracy of the measurement is obtained.

Regarding claims 4-5 and 15, the vacuum chuck (80) in figure 9 of Ledger is considered as translation mechanism.

Regarding claims 6, 10-14, 26, 30-34, 42-49, see column 5, lines 33-43 for one or more properties of the one or more films.

Regarding claims 8-9, 28-29, see claim 1 of Ledger for comparison.

Regarding claims 20 and 22, using wireless or optical communication link is well known in the art.

Regarding claims 50-51, see figure 1 of Ledger for the reflected light perpendicular to the surface.

Regarding claims 52-53, see figure 1 of Cabib et al.

Regarding claims 54-55, Ledger does not use polarized light.

Regarding claims 58-61, Ledger does not explicitly teach that the properties relate to metal leads. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the basis device of Ledger for detecting the properties of a substrate having metal leads because the device would function in the same manner.

Art Unit: 2877

3. Claims 56-57 and 62-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ledger, Cabib et al and Finland reference as applied to claims 1-55, 58-61 above, and further in view of Tompkins et al (Spectroscopic Ellipsometry and Reflectometry).

Regarding claims 62-63, Ledger does not explicitly teach the use of a reflectometry such as an ellipsometry system. However, such a feature is known in the art, for example, taught by Tompkins et al (of record). Tompkins et al discloses a spectroscopic ellipsometry and reflectometry (described in page 18 of present specification) for measuring the thickness of a film layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the system of Ledger by a reflectometry system or ellipsometry system for the same purpose of determining the thickness of a layer. The substitution for one another is generally recognized as being within the level of ordinary skill in the art.

Regarding claims 56-57, it is inherent that the polarized light is used in the ellipsometry system.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Greenberg et al (5,042,949) teaches the use of an imaging spectrophotometer for measuring film thickness (column 5 lines 42-46); Kokubo et al (5,686,993) discloses a method and apparatus for measuring film thickness.

Art Unit: 2877

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoa Q. Pham whose telephone number is (703) 308-4808. The examiner can normally be reached on 6:30 AM to 5 PM, Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (703) 308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Hoa Q. Pham
Primary Examiner
Art Unit 2877

HP
April 4, 2003